

Elizabeth Anderson, Ph. D. June 5, 2003

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1 IN THE UNITED STATES BANKRUPTCY COURT FOR THE
2 DISTRICT OF DELAWARE

3
4 IN RE:

5 W.R. GRACE, et al.,

Chapter 11

01-01139 (JKF)

6 Debtors.
7
8

9 COPY
10

11 DEPOSITION OF: ELIZABETH L. ANDERSON, Ph.D
12
13

14 DATE: June 5, 2003
Thursday, 9:22 a.m.

15
16
17 LOCATION: REED SMITH, LLP
435 Sixth Avenue
18 Pittsburgh, PA 15219
412-288-3131

19
20
21 TAKEN BY: Claimants
22

23
24 REPORTED BY: G. Donavich, RPR, CRR
Notary Public
AKF Reference No. Gd75794
25

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1 Q. Okay.

2 A. I believe that's it. I don't believe I talked
3 to any other experts in this case concerning
4 this case.

5 Q. Did you speak to Dr. Lee or someone with his
6 group?

7 A. I spoke to some people in his group. I don't
8 believe I've spoken to him directly about the
9 case. I did speak to Dr. Ilgren, as I recall.

10 Q. Let's start at the top. What did you and
11 Dr. Corn discuss about your deposition today?

12 A. I was interested in his views. I have known
13 him since he was a very prominent peer reviewer
14 at the EPA and head of OSHA, and I knew he was
15 intimately aware of contractor activities, and
16 I wanted to know specifically what his views
17 would be of contractor activities with respect
18 to attic insulation.

19 Q. Did you speak to anyone else about contractor
20 activities in attic insulation?

21 A. Certainly with my staff, and I believe that's
22 pretty much it. In general, I've asked
23 everybody I know questions of -- in passing,
24 I'll ask how long it takes you to do certain
25 activities in a home. That's hardly a

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1 scientific study.

2 Q. What sort of issues did you talk to Dr. Lee
3 about?

4 A. Dr. Lee has provided the underlying analysis
5 for the fiber concentration data for the work;
6 and from time to time, I've had clarification
7 issues to discuss.

8 Q. So do you rely on Dr. Lee for his fiber counts
9 that were done in this case?

10 A. Yes, sir. I think we've made that very clear
11 in the report, that we have relied on his fiber
12 counts.

13 Q. Okay. And with Dr. Ilgren, what did you
14 discuss with him?

15 A. I spoke very briefly to Dr. Ilgren about his
16 expert report concerning the toxicity of
17 cleavage fragments, and I read his report.

18 Q. You haven't done any independent work on
19 cleavage fragments, have you?

20 A. You mean conducting studies in the laboratory?

21 Q. Any research or studies independently.

22 A. I have not conducted laboratory studies on
23 cleavage fragments.

24 Q. The statements you make in your report about
25 cleavage fragments, you cite to Dr. Ilgren when

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1 assessment, the strengths, weaknesses, and
2 that's very consistent with what I said.

3 BY MR. WOOD:

4 Q. This model that you've had a chance to briefly
5 review, is that the same model you used in your
6 risk assessment?

7 A. It's the same paradigm that I used.

8 Q. Would you agree that risk assessment is only as
9 reliable as the information that's used to
10 create it?

11 A. I wouldn't state it that way.

12 Q. How would you state it differently?

13 A. I think the confidence in the risk assessment
14 outcome reflects the quality and quantity of
15 the information that you have to use in order
16 to do the assessment.

17 Q. So the confidence that you would have in a risk
18 assessment outcome reflects the quality and
19 quantity of the information that you used to
20 create it? Did I state that correctly or --

21 A. I think your question is a misstatement in a
22 sense, so let me try to get at what I think
23 you're asking here.

24 Q. Sure.

25 A. You're asking if you can have confidence in a

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1 risk assessment depending on some threshold of
2 quality and quantity of data is, I believe,
3 what you're trying to ask me, and I would like
4 to answer that a little differently, and that
5 is risk assessments are necessarily uncertain.
6 If we knew all the answers, we would not be
7 doing a risk assessment.

8 The concept of doing a risk
9 assessment is to organize the scientific
10 evidence and present it, and the uncertainty
11 should be expressed.

12 Now, I don't like the use of the word
13 "competence." I like the use of the word
14 "certainties" and characterization of those
15 certainties, because I think that is a part of
16 the risk assessment process, part of the
17 paradigm, so I think those should be expressed
18 clearly, as best you can express them.

19 Q. Can you tell me what is untrue about this
20 statement so that I can sort of understand what
21 you're saying. When I say risk assessment is
22 only as reliable as the information used to
23 create it, what about that statement do you
24 disagree with?

25 A. The word "reliable." Decisions must be made.

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1 THE WITNESS: The risk assessment is
2 the presentation of the known scientific
3 information organized according to a paradigm
4 that's intended to inform.

5 From my long-time experience at EPA,
6 the use of risk assessment was not something
7 that someone could decide was reliable or not,
8 because if decisions need to be made, they need
9 to be made based on the evidence that's
10 available, so you don't present a risk
11 assessment and say there's scientific
12 uncertainty, therefore I did a risk assessment,
13 this is what I know, don't rely upon it.

14 You present it and present the
15 uncertainties, you try to characterize what's
16 known and not known as fairly as possible, and
17 that becomes the evidence that is available for
18 that particular decision.

19 BY MR. WOOD:

20 Q. If there are numerous uncertainties and many
21 assumptions made in a risk assessment and all
22 of those are described in the risk
23 characterization compared to another risk
24 assessment where at the risk characterization
25 they say all of this evidence is

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1 to be made, that's what you rely on if a
2 decision must be made. That's the evidence as
3 it is.

4 The idea of the risk assessment
5 process is to fairly present that evidence.
6 The weight of evidence is a very important
7 concept.

8 The more information and the better
9 the quality of information to address the
10 particular issues at hand, the louder and
11 clearer the signal is, the weight of evidence
12 then becomes sometimes loud and clear and
13 sometimes quite weak, but you present the
14 evidence as it is, and using the paradigm,
15 present what you know. You don't present it
16 and say don't dare make a decision is what I'm
17 trying to say to you, so that's why I don't
18 know how you're using this word "reliable."

19 I'm using a set of terms under this
20 risk characterization that I feel is a fair way
21 to present the evidence you have, and it's to
22 present the uncertainties and to try to
23 characterize the nature of those uncertainties.

24 Q. When a risk assessment is being peer-reviewed,
25 is it fair to challenge the amount of

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1 I don't recall whether I did or not.
2 I believe if Grace had had information on the
3 exact number of houses nationwide that had
4 attic insulation, I probably would have been
5 give than data.

6 - - - -

7 (There was a discussion off the record.)

8 - - - -

9 BY MR. WOOD:

10 Q. A second ago you said that you didn't think
11 Grace would have records going back to the
12 1930s.

13 Do you have any factual basis for
14 that?

15 A. I have no factual basis to describe what
16 W.R. Grace has in their records and what they
17 don't have in their records.

18 I know that they only acquired the
19 facility in, I believe, 1964, so I would assume
20 that they probably don't have detailed records
21 of the prior owner's activities, but I don't
22 know that, and I wouldn't regard necessarily
23 getting corporate records as any means that I
24 could use to getting how many total homes have
25 attic insulation. This is an approximation, as

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1 is the denominator. It's the best
2 approximation I could make.

3 Q. Did you note in your risk characterization that
4 your estimate of homes with ZAI was based on
5 such a limited window of sales?

6 A. I don't recall. We can look at it, but I think
7 the point is the denominator is probably also
8 low, so that if the numerator is low, then my
9 percentages are probably adjusted in some way,
10 and these are the best data. You can only deal
11 with the best data you have at the time you're
12 doing an assessment and identify its source.

13 If, in fact, there are twice as many
14 homes, if the percentage is two percent instead
15 of one percent or if it's three percent, it's
16 not going to change the risk outcomes in this
17 risk assessment.

18 Q. So by changing the numbers that you plug into
19 your formula, you're saying that the end
20 result, the risk assessment, will not be
21 affected?

22 A. I did not say it would not be affected. I said
23 in a very minor way. If the risks go up by
24 twofold or threefold, it's not going to change
25 the overall conclusion; plus, I already told

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1 you these are plausible upper-bound estimates,
2 and the second thing I've told you is I have
3 overestimated risks in a number of ways.

4 The third thing I've done is
5 aggregated all the risks assuming the same
6 person does all of these functions, which
7 artificially multiplies the numbers three- and
8 fourfold anyway.

9 Q. We'll get to all those things soon.

10 In the same paragraph on Page 35 of
11 your report where you have your estimate of the
12 number of homes, your estimate of the total
13 number of homes in the United States, you state
14 that the frequency of homes may be higher in
15 colder climates.

16 A. Yes.

17 Q. I don't disagree with that, but I wanted to
18 know what your factual basis was for that. Did
19 you look at any regional sales records for
20 Grace?

21 A. No. What I did is I, first of all, had thought
22 a twofold increase would be ample, and then I
23 spoke to Dr. Corn, who had some knowledge, and
24 he thought that threefold would be so amply
25 overstating it, that it would certainly be

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1 acceptable.

2 So he and I had a discussion about
3 the frequency of VAI homes, and that's what I
4 settled on as an upper-bound estimate of the
5 number of homes that today have VAI.

6 Q. Okay.

7 A. Now, in order to improve this number, you can't
8 get the number of homes that have VAI from
9 sales records, because many homes have been
10 taken down, they've been demolished, they've
11 been renovated, they've been changed. They no
12 longer represent sales records, and so if you
13 want a very precise figure, I suppose you'd
14 have to send a survey to everybody in the
15 country.

16 Q. I guess the question you raised about sales
17 figures would apply just as well to the Versar
18 numbers you came out with, because that was
19 based on the distribution of VAI.

20 A. But I think my report was -- this was a report
21 commissioned under contract to EPA; it's a
22 lengthy consideration of the issue.

23 I did not have the time to do the
24 kind of consideration these people did. They
25 did it, they reported their results; I have

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1 of asbestos, we don't have precise information
2 on many things, and, yet, we have methods that
3 allow us to make some reasonable estimates.

4 Now, if someone wants to give me
5 additional information that allows me to
6 improve on these estimates, I will be very
7 happy to take it and review it.

8 Q. Did Grace give you any additional information
9 to improve the estimates that you included in
10 the report?

11 A. Don't you think if I had it I would have used
12 it?

13 Q. I'll take that as a no.

14 We got sidetracked there. We started
15 to float back into the homes with VAI and the
16 total homes, but you said that the scientific
17 basis for choosing three percent was a
18 discussion you had with Dr. Corn and --

19 A. That is not correct.

20 Q. Okay. What --

21 A. I said that was a factor in my considerations.

22 Q. What other factors did you use?

23 A. I considered the literature.

24 Q. What literature?

25 A. I have cited the literature I ended up using.

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1 Q. Could you point that out in your report too?

2 A. You and I have just been discussing it.

3 Q. I'm talking specifically about the three
4 percent number.

5 A. I said there are no survey numbers available.
6 If, in fact, the rate of the VAI-containing
7 homes is roughly one percent nationwide, that
8 is an approximation from the literature we
9 have. Three times that number for a colder
10 climate we regarded as an ample upper bound.

11 Q. What's the basis for your decision that that is
12 an ample upper bound?

13 A. It's three times the national average.

14 Q. And it's as simple as that?

15 A. Three times national average seems a very
16 reasonable estimate.

17 Q. Staying on this same page, what was the
18 scientific basis for assuming that contractors
19 would come into contact with ZAI on ten percent
20 of their jobs?

21 A. It's an estimate based on the activities that
22 we perceive to be contractor activities. When
23 they come into a home, they do many different
24 things, and if they go to an attic, they may
25 not even contact VAI, so we consider ten

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1 percent, and we said it's assumed to be an
2 upper-bound estimate of the probability they
3 would contact VAI.

4 Q. And when you're saying --

5 You said "we" think. Who --

6 A. We presumed.

7 Q. My question was about the "we." Who is it that
8 helped you make the decision that ten percent
9 was a good assumption?

10 A. We talked amongst ourselves, we --

11 Q. Who were the --

12 A. Within my organization.

13 Q. Okay.

14 A. I also discussed this assumption with Dr. Corn,
15 who has been involved for a long period of time
16 in industrial hygiene, and we made the
17 assumption that ten percent of the time that
18 they're in a home, when you think of what
19 contractors do in homes, they come and they do
20 many, many things. They go to attics and do
21 many things.

22 Only ten percent of the time actually
23 contacting VAI in the home seemed a very ample
24 estimate of the time they would actually
25 contact VAI.

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1 Q. Is that ten percent number on jobs in the attic
2 or ten percent of all jobs that a contractor
3 would --

4 A. Ten percent of all jobs.

5 Q. Have you taken into consideration in your risk
6 assessment that ZAI has also been used in walls
7 as insulation, and that contractors, and in
8 this case also homeowners, would come into
9 contact with ZAI not only in their attic but
10 also in form work and walls?

11 A. I don't know the distribution of VAI in walls,
12 as well as attics, but we thought ten percent
13 of the time was such a large number to actually
14 be contacting VAI among all the activities they
15 do in a home, we thought it was a very ample
16 estimate.

17 Q. Did you contact any national or regional
18 contractor organizations or do any type of
19 polling or anything to come up with that
20 number, or was that just a number that you
21 decided was reasonable?

22 A. This was the best information I could use at
23 the time.

24 Q. Again --

25 A. By the way, this is very clear. It says

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1 contact VAI, and the result of all those
2 calculations are presented here.

3 Q. And the results of all that is .29, which is
4 the days per year they contact VAI.

5 A. On the average for each activity.

6 Q. So once every three years --

7 A. For each activity.

8 Q. Okay.

9 A. On average.

10 Q. Okay.

11 A. And .75 at the high end.

12 Q. Do you know if there were contractors who
13 specialize in areas that would consistently
14 cause them to work in ceilings, attics, or in
15 wall spaces?

16 A. I don't know that there are contractors who
17 just do nothing but work in attics. I can't
18 imagine why they would do that, but if there
19 are people like that, I don't know them.

20 Q. Would you agree that most homes with ZAI are at
21 least 15 to 20 years old based on the fact that
22 Grace started selling VAI in 1984?

23 A. Most homes, if they have VAI left and have not
24 been previously renovated or rebuilt or razed,
25 would be at least that old or older, I would

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1 guess.

2 Q. Do you know whether homes that are at least
3 that old or older typically have different
4 types of renovations done to them than newer
5 homes?

6 A. I have no idea. I'm not a billing expert.

7 Q. Can we go back to Page 11.

8 - - - -

9 (There was a recess in the proceedings.)

10 - - - -

11 BY MR. WOOD:

12 Q. I think the last thing I said was go to
13 Page 11, hazard identification. That's the
14 first step of the risk assessment paradigm.
15 Right?

16 A. Yes.

17 Q. Steps 2 and 3, the dose-response and the
18 exposure, do they weigh into the decision of
19 whether the substance is a carcinogen?

20 A. The information about the nature and type of
21 disease that can occur is part of the weight of
22 evidence, as is the nature and type of exposure
23 as it relates to the pharmacokinetics, so they
24 can be answers, yes, they can weigh in.

25 Q. Has EPA classified asbestos as a Class A

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1 objection. If you can answer it, please do.

2 THE WITNESS: I think that answer is
3 threefold. First of all, if I can't separate
4 out the cleavage fragments, I can't do a risk
5 assessment, because I can't use the EPA metric,
6 the IRIS dose-response metric, to do any work,
7 so, one, it's necessary to separate them.

8 BY MR. WOOD:

9 Q. You misunderstood my question, and I'll maybe
10 save you some time.

11 What I said is if he was wrong and
12 there weren't cleavage fragments that needed to
13 be separated, if claimants' expert's fiber
14 counts were correct and there were not cleavage
15 fragments included in those, would that change
16 your risk assessment?

17 A. You mean if the fiber concentrations changed
18 regardless of whose fiber concentration, if the
19 PCME metric that's appropriate to the EPA
20 metric for the use of the IRIS file, if the
21 concentrations go up, will risk go up, and the
22 answer is yes.

23 Q. What's your understanding of the work that was
24 done during the Pinchin study?

25 A. My understanding is there was a demolition

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1 clearance done for Lee's, who else did you
2 receive input from or what other sources of
3 information did you have?

4 A. I told you we also reviewed the Ewing work, and
5 he did it -- we called it a small area of
6 clearance. The observations of his work he did
7 in removing insulation from the tops, I believe
8 he described it -- the very tops of walls.
9 I've forgotten his exact description, but he
10 used a shop vacuum, and again, his times, I
11 believe, were around 45 minutes for that
12 activity, and it was a larger area than just
13 wiring, as I recall.

14 Q. So your assumption that it would take half an
15 hour and typically an hour and a half on the
16 high end is based on the simulations that were
17 done by Grace's experts and by claimants'
18 experts?

19 A. Plus, in all these cases, our own internal
20 sense of how long it really takes to do this
21 kind of thing in our own homes, and we also
22 reviewed all of these assumptions with Dr. Corn
23 and asked for his input from his experience
24 with buildings and homes.

25 - - - -

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1 clearance, and I just extrapolated that to a
2 large area of clearance in a large home the
3 size of the Busch attic.

4 Q. That was mathematically you took the 16 square
5 feet in the Lee study for the large area and
6 multiplied that so it was big enough to do the
7 whole attic?

8 A. Uh-huh, and the same thing for the Ewing study.

9 Q. Are the typical exposures intended to represent
10 the average resident or contractor exposure?

11 A. Well, to represent in a conservative way, yes.

12 Q. In your risk assessment, did you take into
13 consideration whether homeowners were smokers?

14 A. No, I did not. I was not assessing risk for
15 particular individuals but rather generically
16 for people who performed these tasks, so I did
17 not, nor does EPA's dose-response curve, take
18 into account smokers, and since that factor and
19 those responses to curves is derived from the
20 occupational setting, I'm sure there were
21 smokers in those cohorts.

22 Q. Did you take into consideration when you made
23 your exposure durations for removal of ZAI or
24 any of these other activities the deposition of
25 claimants and claimants' witnesses?

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1 A. I had not read those depositions.

2 Q. So you did not take any of those into account?

3 A. No.

4 Q. In the simulation that Ewing did on moving
5 aside ZAI, homeowner method, that was what you
6 treated as a large removal --

7 A. Right.

8 Q. -- do you recall the technique they used to
9 remove the ZAI?

10 A. I believe they scooped it out, but I can't
11 recall exactly.

12 Q. I'm not trying to trick you. They scooped it
13 out with a dustpan and then cleaned up with a
14 whisk broom and a dustpan, and all of this was
15 bagged in trash bags.

16 A. (Witness nods head.)

17 Q. Is that the same removal method that would be
18 used in your Scenario No. 5, removal of ZAI,
19 which is scooping, bagging, and sweeping
20 activities?

21 A. It could be, or it could be a more efficient
22 system.

23 Q. Was a more efficient system used in any of the
24 simulations to remove ZAI, whether it was from
25 a small area or a large area?

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1 A. I would think that the vacuuming that was used
2 in the total removal at the Busch house might
3 be more efficient, but I beg to establish
4 quickly for the record that I am not a removal
5 expert.

6 Q. The exposure levels that were arrived at -- and
7 when I say "exposure levels" -- scratch that.
8 The fiber levels that were arrived at in the
9 claimants' studies for the large removal using
10 the homeowner method as they describe it, could
11 those fiber levels be plugged into your
12 exposures for removal of ZAI?

13 A. Once they are correctly adjusted to collect
14 PCME, they can be used in the methodology with
15 the IRIS database, and also corrected for the
16 frequency and duration and the level of
17 exposure.

18 Q. Okay.

19 A. The time-weighting factors.

20 Q. Page 33 -- I'll try to move this along
21 quickly -- you have the average tenure for a
22 home is nine years.

23 A. That's right.

24 Q. And where did that number come from?

25 A. From the EPA exposure factors handbook.

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1 predominantly ones and you, other than for
2 moving boxes, have all ones, also --

3 A. I considered all of these. I didn't use them
4 directly. In fact, we went beyond them and
5 considered in many cases where we thought it
6 was justified higher number of total hours per
7 year, so I didn't directly translate what they
8 did to what I did, because the scenarios
9 weren't exactly the same, but we did consider
10 their estimates of exposure, frequent
11 circumstance and duration, and in no case did
12 we estimate anything lower that would end up
13 with a total lower hours per lifetime in the
14 scenario.

15 Q. I'm just focusing on the exposure frequency.
16 Did you look to the Versar study to decide that
17 many of these activities that were similar to
18 what you have listed here would only occur once
19 a year?

20 A. I said I used the Versar study, together with
21 any of the other information I had, or in
22 discussions with Dr. Corn and in our internal
23 discussions we have a long track record in
24 frequency and duration of exposures and used
25 our professional judgment.

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1 Q. You have referred to speaking to people in your
2 office about this.

3 How many people do you have in your
4 office you talked to about this?

5 A. I have no idea what number of people discussed
6 this. Somewhere probably between three and a
7 dozen.

8 Q. Just depending on who was around for the
9 discussion?

10 A. This company is ten years old. We have a long
11 track record, and before this company many of
12 the individuals involved have been involved in
13 these kinds of activities for long careers, and
14 we are very familiar with how frequencies and
15 durations are obtained. We use that
16 professional judgment.

17 I think someone coming in who has
18 never looked at these issues before would be
19 less capable. We use the professional
20 judgment, the duration of the studies, and also
21 discussed it with Dr. Corn, who is very, very
22 knowledgeable about these matters.

23 Q. Do you remember what specifically in the
24 studies or where in the studies or which
25 studies had exposure frequencies in them?

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1 A. My recollection is Versar was the only one that
2 had exposure frequencies. I don't recall if
3 there's any discussion in the other studies at
4 this point in time. If there was, we
5 considered it, but obviously Versar and EPA did
6 consider particularly exposure frequency and
7 duration and exposure times in their tasks,
8 because they did perform a risk assessment.

9 - - - -

10 (There was a discussion off the record.)

11 - - - -

12 BY MR. WOOD:

13 Q. What sort of research or studies do you have in
14 your office? You said we've done these sorts
15 of things before. What other sort of similar
16 studies and research have you done that's
17 related to attic activities?

18 A. You don't have to relate everything to an attic
19 activity to have some feel and professional
20 judgment about the duration of particular kinds
21 of activities and the exposure frequency.

22 How often they are likely to occur,
23 there is a very long track record.

24 In any particular office, we have
25 performed literally hundreds and hundreds of

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1 risk assessment where these considerations are
2 part of those studies. We are fully familiar
3 with the EPA guidance and we certainly have
4 applied --

5 Q. So I can get a feel for this, what similar sort
6 of activities has your office looked at before
7 that you could relate to removing Zonolite
8 attic insulation with a dustpan and a broom
9 from the attic?

10 A. I said it's professional judgment.

11 Q. Okay. The next column, exposure duration, nine
12 and thirty, I know where those came from.
13 That's the length of time someone -- the
14 average time someone lives in the house and the
15 90th percentile.

16 What are you looking at?

17 A. This next column, exposure duration.

18 Q. All right. I know where the nine years comes
19 from and where the thirty years comes from.
20 The rest of that column, where did all of those
21 numbers come from?

22 A. The same --

23 All of these, if you want to discuss
24 each one individually --

25 Q. If it's the same source --